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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------|------------------------|
| 10/777,258 | 02/12/2004 | David A. Torrey | AEC-0003 | 5415 |
| 23550 7590 06/18/2007 HOFFMAN WARNICK & D'ALESSANDRO, LLC 75 STATE STREET 14TH FLOOR ALBANY, NY 12207 | | | EXAMINER STERRETT, JEFFREY L | |
| | | | ART UNIT 2838 | PAPER NUMBER |
| | | | MAIL DATE 06/18/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---------------------------------|-------------------------------|--|
| Office Action Summary | Application No. 10/777,258 | Applicant(s) TORREY ET AL. | |
| | Examiner Jeffrey L. Sterrett | Art Unit 2838 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-16 and 18-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-16, and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/17/07</u> . | 6) <input type="checkbox"/> Other: _____ |

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1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 12, 15, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakano (US 5,134,307) in combination with Gold et al (US 5,625,548).

Nakano discloses an inverter system comprising a DC source (12); an AC network (T3 and T4); a DC/DC converter (15, 45, and 70) coupled to the DC source synthesizing a rectified sinusoidal time varying current (the DC from bridge rectifier 70 that has ripple/harmonic components that requires filtering by LC filter LDC1/C4) from the DC source and comprising a full bridge MOSFET inverter (Q1-Q4 with inherent parasitic diodes shown and inherent parasitic capacitors not shown), an isolation circuit (45), and a rectifier (70); a controller (42) controlling the full bridge MOSFET inverter; an output smoothing inductor (LDC1) coupled to the output of the DC/DC converter; and a full bridge inverter (77) coupled between the output inductor and the AC network comprising switches (S1-S4) as recited by claims 1, 12, 15, and 20 except for specifying that the AC output of inverter 77 is connected to and in phase with an AC utility. Gold et al discloses as an old and known expedient in the art at the time of the invention that when the output of an inverter is connected to an AC utility it is very desirable, if not required, that the inverter be in phase with the utility (for example see lines 26-29 of column 4 and lines 9-12 of column 5). It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inverter system of Nakano by phase synchronizing the AC output of the inverter 77 with an AC utility when the AC utility is the intended load of the inverter in order to properly add power to the utility as taught by Gold et al.

3. Claims 1, 2, 4-16, and 18-21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Welches (US 6,404,655) in combination with Zhang et al (US 6,466,458).

Welches discloses an inverter system comprising a DC source (15); an AC utility (60); a DC/DC converter (30) coupled to the DC source synthesizing a rectified sinusoidal time varying current (the DC from bridge rectifier 20 that has a ripple/harmonic components that requires filtering by LC filter L1/L2/C3/C4) from the DC source and comprising a full bridge MOSFET inverter (MOS1-MOS4 with inherent parasitic diodes and capacitors), an isolation transformer (25 with inherent parasitic inductances), and a rectifier (20); a controller (100) controlling the full bridge MOSFET inverter; an output smoothing inductor (L1 and/or L2) coupled to the output of the DC/DC converter; and a full bridge inverter (40) coupled between the output inductor and the AC utility comprising switches (Q1-Q6) as recited by claims 1, 2, 4-16, and 18-21 except for utilizing a phase shifted bridge inverter as inverter (MOS1-MOS4). Zhang et al teaches phase shifted bridge inverters (figure 3) were an old and known expedient in the art at the time of the invention. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the inverter system of Welches by utilizing a phase shifted bridge inverter as inverter (MOS1-MOS4) in order to obtain zero voltage switching as taught by Zhang et al.

4. Applicant's arguments filed April 17, 2007 have been fully considered but they are not persuasive.

In response to the remarks that the combination of Nakano and Gold et al fails to disclose providing a rectified sinusoidal time varying current at the output of the DC/DC

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converter as currently recited by the instant claims, this is simply incorrect. By their very nature bridge inverters, like 15 disclosed by Nakano, generate or synthesize a bipolar square wave output which when input to isolation means 45 of Nakano naturally becomes a sinusoidal (or at least for all intents and purposes a nearly sinusoidal) time varying AC waveform which when input to a full wave rectifier 70 of Nakano becomes a rectified sinusoidal time varying current. It is recognized that Nakano, like applicant, then filters and/or smoothes the rectified sinusoidal time varying current before inverting this DC into AC, but this does not negate the fact that Nakano nevertheless generates or synthesizes a rectified sinusoidal time varying current at the output of the DC/DC converter.

In response to the remarks that the combination of Welches and Zhang et al fails to disclose providing a rectified sinusoidal time varying current at the output of the DC/DC converter as currently recited by the instant claims, this is simply incorrect. By their very nature bridge inverters, like MOS1-MOS4 disclosed by Welches and S1-S4 disclosed by Zhang et al, generate or synthesize a bipolar square wave output which when input to a transformer, like 25 of Welches and Tr of Zhang et al, naturally becomes a sinusoidal (or at least for all intents and purposes a nearly sinusoidal) time varying current AC waveform which when input to a full wave rectifier, like 20 of Welches and D1/D2 of Zhang et al, becomes a rectified sinusoidal time varying current. It is recognized that Welches and Zhang et al, like applicant, then filters and/or smoothes the rectified sinusoidal time varying current before inverting this DC into AC, but this does not negate the fact that Welches and Zhang et al nevertheless generate or

synthesize a rectified sinusoidal time varying current at the output of the DC/DC converter.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

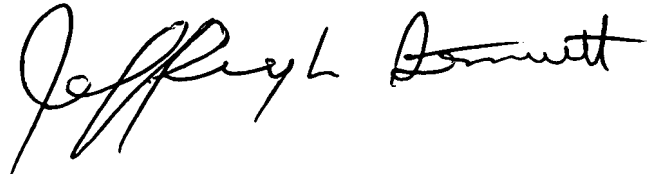
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey L. Sterrett whose telephone number is (571) 272-2085. The examiner can normally be reached on Monday-Thursday & 7:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl D. Easthom can be reached on (571) 272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeffrey L. Sterrett
Primary Examiner
Art Unit 2838

A handwritten signature in black ink, appearing to read "Jeffrey L. Sterrett", written in a cursive style.